

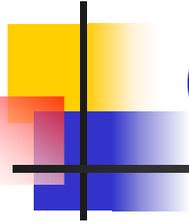
Development of Cool Colored Roofing Materials

Collaboration between ARC, LBNL and ORNL

Sponsored by the
California Energy Commission
(Project Manager: Chris Scruton)



History of Research & Collaboration



- Began 11-1-2001 under ESIG Grant 52506A /01-20 to study cool coatings with aid of Hashem Akbari and Ronnen Levinson LBNL. Report submitted February 2, 2004.
- ARC explored many cool pigment coatings & selected seven to develop and promote which offer wide color palette.
- ARC tested cool coatings in Southern California at Riverside Public Utilities on model buildings and demonstrated 5-7% savings in energy.
- ARC is testing cool coatings in Sacramento on houses in conjunction with Hanson Roofing and ORNL.
- ARC has trademarked these as **COOLTILE IR COATINGS™** and is promoting them in eco-structures March/April issue.
- ARC is actively promoting these cool coatings to tile manufacturers with the intent of selling them on the OEM use of such cool products.

COOL TILE IR COATING™ Applied to Hanson Tile on 2nd A-Style Home

SR=0.41	SR=0.44	SR=0.44	SR=0.48	SR=0.46	SR=0.41
<i>black</i>	<i>blue</i>	<i>gray</i>	<i>terracotta</i>	<i>green</i>	<i>chocolate</i>
SR=0.04	SR=0.18	SR=0.21	SR=0.33	SR=0.17	SR=0.12

- COOL TILE IR COATING™ technology was developed by Joe Reilly of American Rooftile Coatings



Product Testing on Model House in Southern California (RPU)



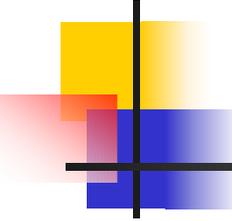
A-Style Homes Finished with Hanson Roof Tile and Stucco



House-1 4979 Mariah Place

House-3 4987 Mariah Place





Cavalli Hills Roof Before Coating

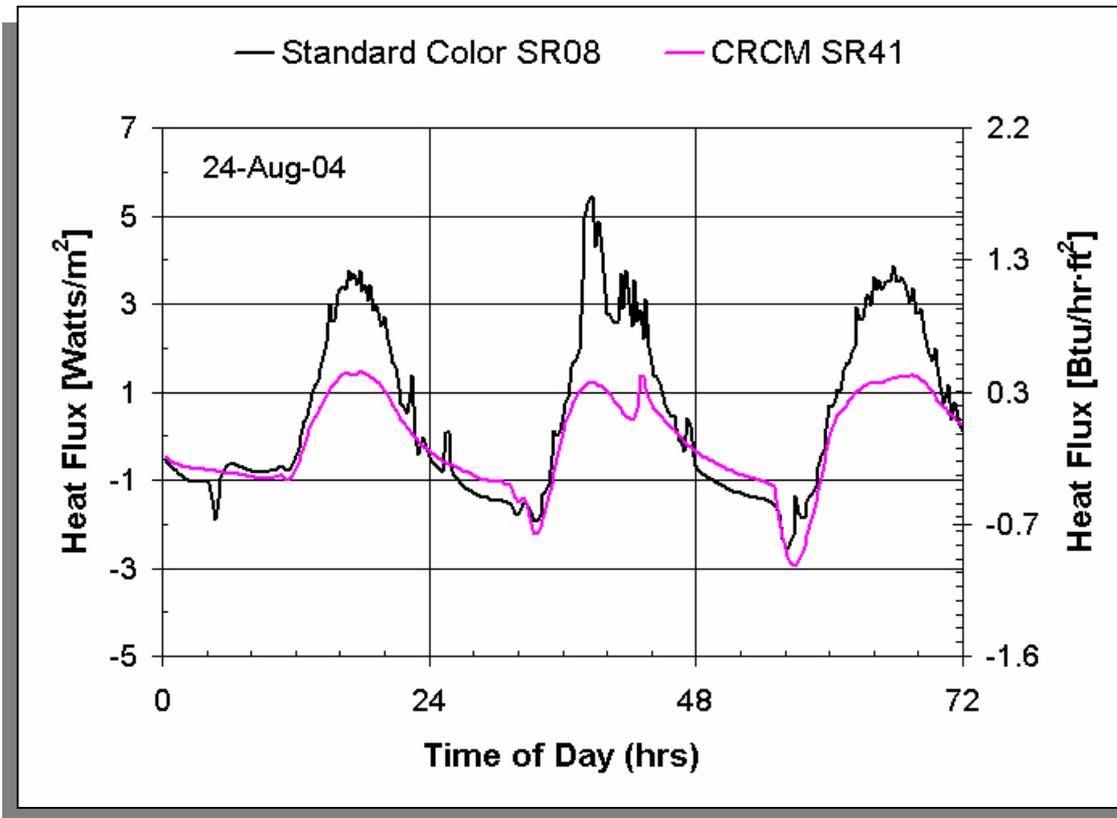


Cavalli Hills After Coating



Cool Coating Reduces Heat Flux Through Ceiling

Hanson Tile Roofs

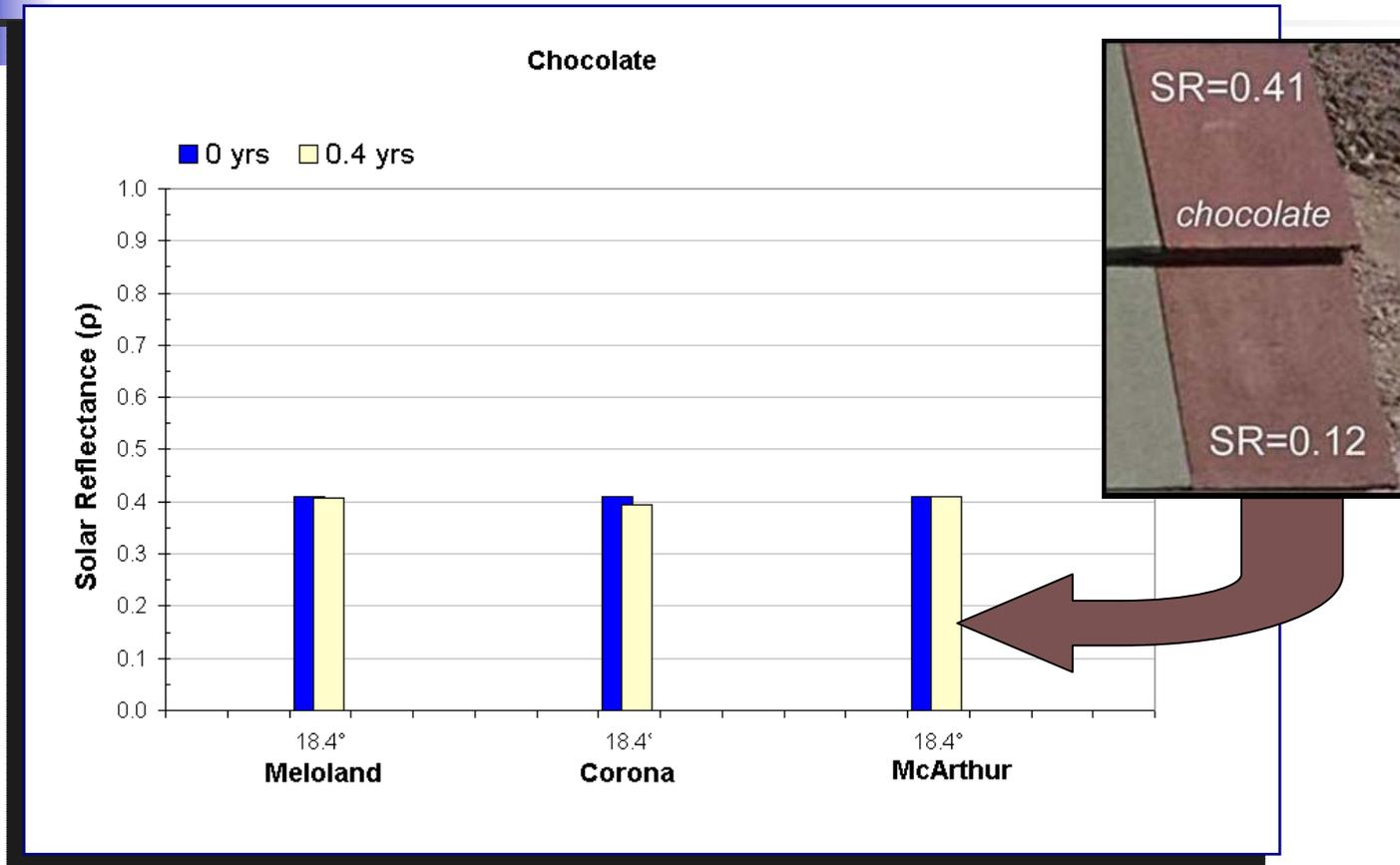


Concrete and Clay tile and Painted Metals under exposure

Clay and Painted Metal exposed for 1½ years



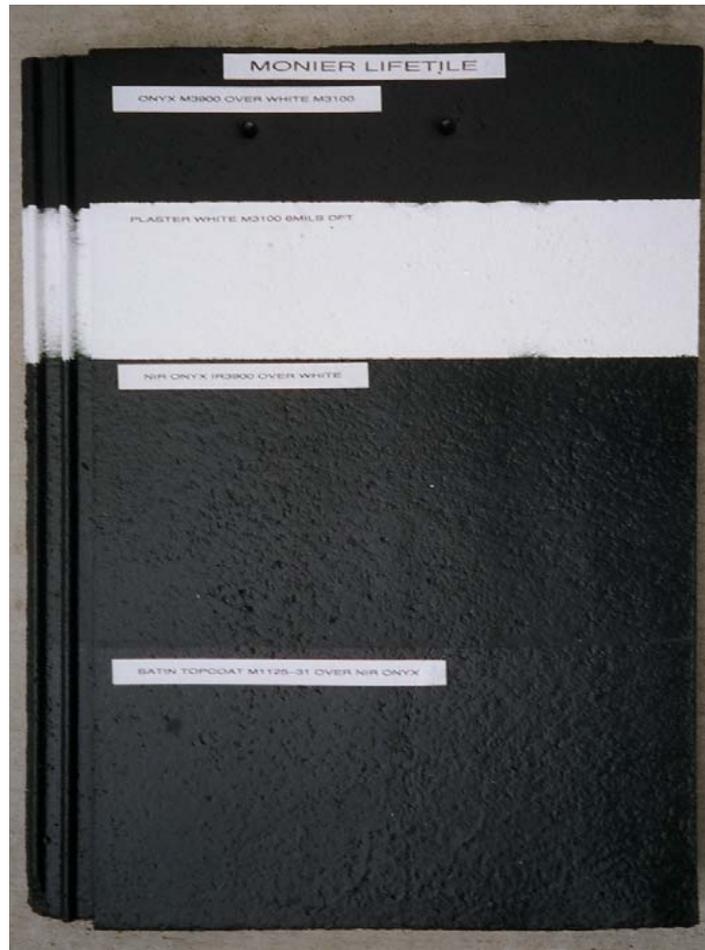
Concrete Tile Coatings under exposure at all seven weathering sites



Eagletile Tiles with ARC Cool Coatings



MonierLifetile™ Black over White



ARC Ad for *eco-structure*

COOLTILE IR COATINGS™
MEETS CALIFORNIA ENERGY GUIDELINES FOR COOL TILE ROOFS

- Apply over new or existing rooftiles
- A full pallet of beautiful colors is available
- Newest technology developed to save energy by reducing cooling costs
- Improve the life of your roof while enhancing the appearance

R=0.41	R=0.44	R=0.44	R=0.48	R=0.46	R=0.41
BLACK	BLUE	GRAY	TERRACOTTA	GREEN	CHOCOLATE
R=0.04	R=0.18	R=0.21	R=0.33	R=0.17	R=0.12

Featured in *eco-structure*, September/October 2004 "A Study Offers Cool Residential Roofing Products"

American Rooftile Coatings
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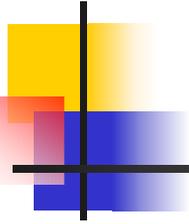
ENERGY STAR PARTNER
 CRRC



Research Issues

- Improving the reflectance of our coatings by including new functional pigments.
- Instruments to measure the solar reflectance of colored concrete tiles in the field on curved surfaces.
- Tools to estimate the cooling energy savings and peak demand reduction achieved by installing cool coatings on specific buildings. ARC believes real savings will exceed 5-7% seen for model buildings.

Research Issues (continued)



- Monitor the solar reflectance and color change on roof materials installed at the California weathering sites
- Testing the solar reflectance, color change, and thermal performance of roofing materials at ORNL test facilities
- Market deployment and large-scale demonstration; this could be driven by rebate or tax credit incentives.